Comprehensive Wastewater Management Plan and Environmental Impact Report Phase I – Needs Analysis and Screening of Alternatives Nantucket, Massachusetts

Prepared for:

Nantucket Department of Public Works Nantucket, Massachusetts

Prepared by:

Earth Tech, Inc. 196 Baker Avenue Concord, Massachusetts 01742-2167

August 2001

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Dear Project Reviewer:

Enclosed please find one copy of the report entitled "Comprehensive Wastewater Management Plan and Environmental Impact Report Phase I - Needs Analysis" (Phase I Report) completed in accordance with the Massachusetts Department of Environmental Protection's "Guide to Wastewater Management Planning" dated January 1996. The review of the Comprehensive Wastewater Management Plan (CWMP)/Environmental Impact Report (EIR) will be through the submission of three documents including: (1) Phase I Report; (2) Phase II CWMP/Draft EIR; and (3) Phase III CWMP/Final EIR.

This Phase I Report is consistent with the general requirements of the MEPA regulations including being circulated per MEPA regulations at 301 CMR 11.16 (3). In addition, three copies will be available for public review at the Town Hall and Department of Public Works. The circulation list is included in the Phase I Report Section 5.

A 45-day public comment period on the Phase I Report will be initiated by a notice of availability for review in the Environmental Monitor. Comments received will be considered in determining the extent to which issues were adequately addressed. If you have comments, please send them to:

Secretary of Environmental Affairs 251 Causeway Street, Suite 900 Boston, MA 02114 Attention: MEPA Unit MEPA # 12654

If you have questions regarding this project, please do not hesitate to contact the MEPA office at 617-626-1000.

Very truly yours, Earth Tech, Inc.

Thomas E. Parece, P.E. Project Director

enclosures

EXECUTIVE SUMMARY

In 1998, the Nantucket Department of Public Works retained Earth Tech, Inc. to prepare an Island-wide Comprehensive Wastewater Management Plan/Environmental Impact Report (CWMP/EIR) to identify areas within the Island with sub-surface wastewater disposal problems and to develop a plan to mitigate or eliminate the problems. The Town has established a special procedure for the review of this major and complicated project. This special procedure is a three-phase process during which the scope of future phases is based largely on the results of the preceding phase. The process consists of filing three documents: (1) Phase I, Needs Analysis and Screening of Alternatives; (2) Phase II, Draft Comprehensive Wastewater Plan and Environment Impact Report; and (3) Phase III, Final Comprehensive Wastewater Management Plan and Environmental Impact Report. The results of the Need Analysis and preliminary screening of alternatives are included in this Document. This Document and further, more detailed analysis during the other phases will provide the basis for the design and ultimate construction of the approved plan.

This document contains the results of extensive efforts by Earth Tech, Inc. and the Town of Nantucket to evaluate the available options for improving the existing on-site wastewater disposal systems. In order to obtain as much information as possible on the existing and projected land use, demographic conditions and population, Earth Tech Inc., coordinated efforts with the Nantucket Planning and Economic Development Commission (NP&EDC). The goals of the NP&EDC coupled with "The Nantucket Comprehensive Plan" are used in evaluations and analyses for the community presented in this Document. Other agencies utilized for information and considered herein are U.S. Soils Conservation Services, U.S. Department of Agriculture, U.S. Coast Guard, local planning officials, the Nantucket Historic Commission, the Natural heritage Program and local Town boards including Assessors, Building Department, Board of Health, Public Works Department and Zoning Officials.

A Town-wide needs analysis was performed to determine whether or not conventional Title 5 septic systems will be effective in disposing of wastewater within a given study area throughout and beyond the 20 year planning period. A two stage approach was utilized in the analysis consisting of (1) a rating criteria matrix created to establish or eliminate a study area as a need area, and (2) an evaluation of each study area based on soils classification, groundwater levels, and a combination of system age and lot size to confirm or eliminate a study area as a need area. During the first stage, a

rating criteria matrix was developed which consisted of four levels of criteria that were assigned rating points. The highest rating was given to actual failures, as compiled from Board of Health records. The second highest rating was given to imminent failures, which are categorical failures based on current Title 5 regulations. The third highest rating was given to septic systems that have a high likelihood of imminent failure, which were septic systems that: (1) had severe groundwater limitations; (2) had severe soil limitations; (3) had septic systems that were built before 1978; (4) had a lot size of one-half acre or less; and/or (5) had two or more septic tank pump-outs occurring within a calendar year. The fourth highest criteria was given to septic systems that have health/water quality issues associated with septic systems located: (1) in a study area with a density of septic systems greater than two per acre; (2) within 100 feet of a surface water body; (3) within a 100 year flood plain; (4) within a Zone II aquifer recharge area and (5) within Harbor Watershed Line or 3,600 feet of Madaket Harbor.

During the second stage of the analysis, each study area was evaluated based on soils classification, groundwater levels, and a combination of system age and lot size. The three criteria being: (1) 50 percent or more of the lots within the study area meeting the age/lot size criteria (built before 1978 and a lot size of one-half acre or less); (2) 30 percent or more of the study area having severe soils limitations (hardpan, bedrock, slope, flooding and wetness); and (3) 20 percent or more of the study area having severe groundwater limitations (seasonally high water table at the surface to 2 feet deep). If two of these three criteria were met, then the study area would be confirmed as a need area.

A side by side comparison of the results of the two evaluation methods was made to determine: (1) if a given area showed consistent need; (2) areas where there was a conflict in need (e.g. areas that showed a need in one evaluation approach and no need in the other) which were then further evaluated in order to identify the real need; and (3) areas of no need, where existing wastewater disposal systems are adequate. This comparison identified small Sub-study Areas which were reevaluated based on the second stage criteria, which included soils classification, groundwater levels, and a combination of system age and lot size. This two stage analytical evaluation confirmed the areas of need.

Based on the above and on the location of a study area which is located near or in a sensitive area, the following Study Areas are recommended as areas of wastewater disposal need: (1) Madaket, (2) Monomoy, (3) Polpis, (4) Pocomo, (5) Quidnet, (6) Siasconset, (7) Somerset, (8) Shimmo, (9) Town, (10) Town - WPZ, (11) Warrens Landing and (12) Wauwinet.

The CWMP/EIR Phase II document will have a preliminary investigation into the viability of siting wastewater treatment facility(s) and/or highly treated wastewater effluent disposal facilities in Nantucket. Site selection, for both the wastewater treatment facilities (WWTFs), and the effluent disposal field(s) will be the most difficult to resolve. The screening criteria to be used to evaluate these potential sites will be based upon ten environmental criteria as follows: (1) wetlands; (2) soils; (3) drinking water supply - wellhead protection areas (Zone I and Zone II); (4) fisheries; (5) waterbodies (distance from surface water); (6) floodplains; (7) sensitive habitats; (8) park lands; (9) recreational resources; and (10) historical interests. The criteria was developed with respect to whether or not there was an existing environmental "Opportunity" or "Constraint" for a site to be utilized for a wastewater treatment facility and/or disposal location. The application of the screening criteria will result in sites which will be selected for technical and site specific environmental evaluation and cost effective analysis.

Wastewater treatment options were evaluated based on four levels of criteria. The first criteria, Technical Factors, included flow and loading, land/site requirements, suitability for groundwater discharge, climate, sludge disposal and ease of operation. The second criteria, Environmental Factors, included groundwater and permitting impacts. The third criteria, Institutional Factors, included community acceptance, regulatory and legal issues. The fourth criteria, Economic Factors, included construction cost and operations cost. Various wastewater treatment technologies were evaluated based on the above criteria. The following four wastewater treatment technologies are considered the most favorable and will be evaluated in detail in Phase II of the CWMP / EIR process: (1) Anaerobic/Anoxic Systems; (2) Constructed Wetlands; (3) Rotating Biological Contactors; and (4) Sequencing Batch Reactors.

The scope of the CWMP/DEIR Phase II document will analyze the selected alternatives in accordance with the revised scope that will be issued by the Secretary of EOEA and comments received on the Phase I CWMP/EIR document. The CWMP/DEIR Phase II document will present draft recommendations for wastewater management in the identified areas of the Town of Nantucket

where existing on-site septic systems are shown to be inadequate for wastewater disposal. Specific recommendations by Study Area will take into account the appropriateness of utilizing: (1) innovative alternative systems; (2) communal systems; and (3) local wastewater collection, treatment, and disposal facilities. The CWMP/DEIR Phase II document will evaluate the environmental impacts, technical design, institutional factors, and project costs associated with each alternative and recommend the appropriate solution to the wastewater disposal problems in the Town of Nantucket on a long term basis.

TABLE OF CONTENTS

			<u>Page</u>
Section	<u>n</u>		
		TRANSMITTAL SUMMARY	ES-1
EXEC	UTIVE	SUMMARY	iii
LIST	OF FIGU	SUMMARYURES	iii
LIST	OF TAE	BLES	
1.0	INTR	ODUCTION	1-1
		BACKGROUND INFORMATION	1-1
	A.		
	B.	PURPOSE AND SCOPE PLANNING AREA AND PERIOD	1-3
	C.		
	D. E.	REVIEW OF PRIOR PLANNING EFFORTS	1-4
2.0	EXIS	TING CONDITIONS	
		INTRODUCTION	2-1
	A.		
	В.		
	C.	ORGANIZATIONAL CONTEXT OF TOWNLAND USE, DEMOGRAPHICS AND POPULATIONLAND USE, DEMOGRAPHICS AND POPULATION	2-7
	D.		
	E.	NATURAL RESOURCES AND ENVIRONMENTALLY SERVICES GROUNDWATER SUPPLY AND QUALITY	2-17
	F.	GROUNDWATER SUPPLY AND QUALITY	2-19
	G.	ON-SITE WASTEWATER DISPOSAL STSTEMS	2-20
	H.	ON-SITE WASTEWATER DISPOSAL SYSTEMSWASTEWATER CONVEYANCE AND TREATMENT SYSTEMS	
3.0	ירו זכו	URE CONDITIONS AND WASTEWATER NEEDS	3-1
3.0	roi	ORD OOTBETTONE	2 1
	A.	LAND USE, DEMOGRAPHIC, AND POPULATION PROJECTIONS	
	А. В.		
	Б. С.	The second control of	
	D.		
	E.	FORECAST OF WASTEWATER FLOWS AND POLLUTANT LOADINGS EXISTING WASTEWATER FLOWS AND POLLUTANT LOADINGS	3-55
	F.		
4.0	TRI	EATMENT AND DISPOSAL SITES	·····
	٨	DEVELOPMENT OF SCREENING CRITERIA	4-1
	A. B.		
	Б.	IDENTIFICATION OF SITES PRELIMINARY SITE SCREENING	4-11
	١.,	T T/T/T/T/T/T/T/T/T/T/T/T/T/T/T/T/T/T/T	

TABLE OF CONTENTS (cont.)

Section	<u>n</u>		<u>Page</u>
5.0	ALTE	RNATIVES FOR WASTEWATER DISPOSAL	5-1
	A.	EXISTING DISPOSAL SYSTEMS AND	<i>r</i> 1
		CONVENTIONAL TITLE 5 SYSTEMS	5-1
	В.	INNOVATIVE/ALTERNATIVE (I/A) OPTIONS	5-6
	C.	WACTEWATED COLLECTION TREATMENT AND	
		DISPOSAL ALTERNATIVES	5-3
	D.	EVICTING WASTEWATER TREATMENT FACILITIES AND	
		SEWER SYSTEM CONNECTIONS AND CAPACITY	5-81
	E.	WASTEWATER REUSE FOR ARTIFICIAL RECHARGE	5-8.
6.0	REVI	EW OF PUBLIC PARTICIPATION PROGRAM	6-1
	Α.	GENERAL	6-1
	А. В.	PUBLIC MEETING	6-4
	ъ. С.	CIRCULATION LIST	6-4
7.0	CON	CLUSIONS AND RECOMMENDED FUTURE ACTION	7-1
		PURPOSE	
	Α.	RECOMMENDED AREAS OF NEED	7-1
	В.	WASTEWATER TREATMENT ALTERNATIVES	7-1
	C.	ALTERNATIVES ANALYSIS DISCUSSION	7-3
	D.	SCOPE OF CWMP/DEIR PHASE II DOCUMENT	7-6
	E.	SCOPE OF CWIMP/DEIK PHASE II DOCUMENT	

LIST OF FIGURES

<u>Figure</u>	<u>]</u>	<u>Page</u>
1C-1	STUDY AREASPo	ocket
2A-1	NATURAL RESOURCES AND ENVIRONMENTALLY SENSITIVE AREAS	ocket
3D-1	TYPICAL LOT CONFIGURATION	3-32
5A-1	CONVENTIONAL TITLE 5 SEPTIC SYSTEM	5-5
5B-1	STEP SYSTEM	5-8
5B-2	SUBSURFACE CLUSTER SYSTEM	5-9
5B-3	RECIRCUL ATING SAND FILTER	5-15
5B-4	A MPHIDROMETM PROCESS	5-1/
5B-5	BIOCLERETM SYSTEM	5-19
5B-6	CHROMAGLASS®	5-22
5B-7	RUCK® SYSTEM	5-24
5B-8	SINGLE HOME FAST®	5-26
5C-1	TYPICAL GRINDER PUMP UNIT	5-37
7B-1	AREAS OF WASTEWATER DISPOSAL NEED	Pocket
	LIST OF TABLES	
<u>Table</u>		Page
2D-1	ZONING DISTRICTS	2-10
2D-1 3B-1	ZONING DISTRICTSACTUAL SYSTEM FAILURES - TOWN WIDERATING CRITERIA POINTS PER DEVELOPED LOT	2-10 3-5 3-26
2D-1 3B-1 3D-1	ZONING DISTRICTS	2-10 3-5 3-26 3-27
2D-1 3B-1 3D-1 3D-2	ZONING DISTRICTS	2-10 3-5 3-26 3-27 3-53
2D-1 3B-1 3D-1	ZONING DISTRICTS	2-10 3-5 3-26 3-27 3-53
2D-1 3B-1 3D-1 3D-2 3E-1	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD5 AND TSS	2-10 3-5 3-26 3-27 3-53 3-54
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD5 AND TSS EXISTING WASTEWATER FLOWS	2-10 3-5 3-26 3-27 3-53 3-54 3-54
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3	ZONING DISTRICTS	2-10 3-5 3-26 3-27 3-53 3-54 3-54 3-57
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD5 AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA	2-10 3-5 3-26 3-27 3-53 3-54 3-54 3-57 3-58
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1 3F-2	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD ₅ AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA SUMMARY OF MONITORING RESULTS VS. TREATMENT REQUIREMENTS	2-10 3-5 3-26 3-53 3-54 3-54 3-57 3-58 4-2
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1 3F-2 4A-1	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD ₅ AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA SUMMARY OF MONITORING RESULTS VS. TREATMENT REQUIREMENTS SUMMARY OF WATER OUALITY CRITERIA FOR CLASS B STREAMS	2-10 3-5 3-26 3-53 3-54 3-54 3-57 3-58 4-2 5-28
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1 3F-2 4A-1 5B-1 5C-1 5C-2	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD ₅ AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA SUMMARY OF MONITORING RESULTS VS. TREATMENT REQUIREMENTS SUMMARY OF WATER QUALITY CRITERIA FOR CLASS B STREAMS PROPOSED EFFLUENT LIMITATIONS	2-10 3-5 3-26 3-27 3-53 3-54 3-57 3-58 4-2 5-28 5-42
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1 3F-2 4A-1 5B-1 5C-1 5C-2 5C-3	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD5 AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA SUMMARY OF MONITORING RESULTS VS. TREATMENT REQUIREMENTS SUMMARY OF WATER QUALITY CRITERIA FOR CLASS B STREAMS PROPOSED EFFLUENT LIMITATIONS CLASS 1 GROUNDWATER PERMIT STANDARDS	2-10 3-5 3-26 3-27 3-53 3-54 3-57 3-58 4-2 5-28 5-45
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1 3F-2 4A-1 5B-1 5C-1 5C-2 5C-3 5C-4	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD5 AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA SUMMARY OF MONITORING RESULTS VS. TREATMENT REQUIREMENTS SUMMARY OF WATER QUALITY CRITERIA FOR CLASS B STREAMS PROPOSED EFFLUENT LIMITATIONS CLASS 1 GROUNDWATER PERMIT STANDARDS AREAS REQUIRED FOR SURFACE APPLICATION OF TREATED EFFLUENT	2-10 3-5 3-26 3-53 3-54 3-54 3-58 4-2 5-28 5-45 5-45
2D-1 3B-1 3D-1 3D-2 3E-1 3E-2 3E-3 3F-1 3F-2 4A-1 5B-1 5C-1 5C-2 5C-3	ZONING DISTRICTS ACTUAL SYSTEM FAILURES - TOWN WIDE RATING CRITERIA POINTS PER DEVELOPED LOT RATING CRITERIA MATRIX ESTIMATED WASTEWATER FLOWS AVERAGE AND PEAK WASTEWATER FLOWS WASTELOAD ESTIMATES FOR BOD5 AND TSS EXISTING WASTEWATER FLOWS EXISTING POLLUTANT LOADINGS ENVIRONMENTAL SITE SCREENING CRITERIA SUMMARY OF MONITORING RESULTS VS. TREATMENT REQUIREMENTS SUMMARY OF WATER QUALITY CRITERIA FOR CLASS B STREAMS PROPOSED EFFLUENT LIMITATIONS CLASS 1 GROUNDWATER PERMIT STANDARDS	2-10 3-5 3-26 3-27 3-53 3-54 3-54 3-57 3-58 4-2 5-28 5-42 5-45 5-45